Global sourcing: Linking category characteristics to the geographical scope of sourcing

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Abstract

One of the key debates in purchasing management today relates to the decision to source products on a global basis. However, there is little research that goes beyond asking what are the drivers and barriers to global sourcing. This paper attempts to address part of this gap by asking whether variables associated with a category's strategy, characteristics and supply markets are related to specific sourcing location choices that range from a purely local to a global basis. This is done by testing whether there are significant differences among these variables across a range of sourcing scenarios.

Introduction

An increasing number of firms are combining domestic and global sourcing as a means of achieving a sustainable competitive advantage (Bozarth et al., 1998). Although the optimal balance of global and domestic sourcing can have a significant effect on competitiveness, it has received little attention by academia (Jin, 2004). Many firms struggle with global sourcing and need to better understand the requirements for effective global sourcing strategies (Petersen et al., 2000).

Global sourcing is increasingly understood as a dynamic process, which is affected by company-specific dynamics and the environmental context (Quintens et al., 2005). Several stage models investigate the development from local sourcing to international and global sourcing (Monczka and Trent 1991 a,b, 1992), and it has been suggested that firms as a whole advance on a continuum from domestic to global sourcing (Trent and Monczka, 2003). Most of these studies, however, focus only on development and enabling conditions of global sourcing on a firm level.

There is a scarcity of studies examining the differences in products that are selected for geographic sourcing scopes, despite the fact that product characteristics have early on been identified as a factor determining the scope of international sourcing (Birou and Fawcett, 1993). The development of global purchasing has raised many questions about the appropriateness of specific types of products or services being sourced on a global basis (Birou and Fawcett, 1993; Salmi, 2006; Demirbag & Glaister). Using purchasing categories - and the more general use of portfolios as a means to simplify the management of a large range of purchased products - has been suggested as a useful lens in the study of sourcing decisions (Gelderman and Semeijn 2006).

Interest in regional aspects of sourcing is evident (Mol et al. 2005; Kedia & Mukherjee, 2009; Demirbag & Glaister, 2010;) The location choice and different sourcing regions have been investigated by analyzing the firm, home and host country factors (Demirbag & Glaister, 2010), thus building on the frameworks in the international business discipline (e.g. Dunning et. al, 2007; Rugman & Verbeke, 2004) However, the focus on the macro and firm level determinants still leaves a gap as comes to studies at the product category level. Another gap relates to empirical analysis: despite the increasing importance of global sourcing in the field, the literature lacks empirical theory testing (Quintens et.al. 2006) and empirical investigations that give references on the phenomenon (Nassimbeni, 2006). We address these gaps by exploring the relationship between category strategic focus, category characteristics, supply market characteristics and the (selected) scope of global sourcing (ranging from fully domestic to fully global) based on a large scale multinational empirical study. .

Literature Review

For the purpose of this paper we focus on three issues at the category level which potentially affect the decision to source locally or on a more global basis. We argue that the particular strategy priority for a category will be a principle driver for sourcing location decisions. We also argue that the characteristics of the category and the nature of the supply market will also have an influence on sourcing location choices.

Category strategies

Purchasing portfolio models are popular tools that are used for analyzing and categorizing purchase items according to common characteristics and a plethora of portfolio models have been suggested in the literature (Day et al, 2010). Kraljic's (1983) seminal model specified that purchasing decisions be taken according to supply market complexity and the importance of the purchase. Later adaptations of the Kraljic model have modified the two dimensions into 'difficulty of managing purchase situation' and 'strategic importance of the purchase' (Olsen and Ellram, 1997), and more recently 'supply risk' and 'profit impact' (e.g. Gelderman and van Weele, 2003), the latter sometimes translated into 'value'. Another type of portfolio model focuses on the nature of supplier relationship instead of the purchase item, for instance highlighting buyer-supplier dependence (and thus power) as a key dimension (e.g. Cousins, 2002; Caniels and Gelderman, 2005).

Given that different categories may require differentiated strategic approaches, we argue that decisions on location of sourcing will be dependent on the strategy priority for a specific category. It is clear that one of the principle strategies relates to reducing costs, and indeed cost reductions and lower prices are the most frequently cited drivers for global sourcing (Bozarth et al. 1998; Contractor et al. 2010). In fact the empirical study by Alguire et al (1994) demonstrated that the most important motivator for global sourcing of the companies they sampled was cost, although this situation may well have changed since their study was conducted and since then research has identified a wide range of drivers for global sourcing (e.g. Quintens et al, 2006). Hence, there are many other motivations, including, e.g., local content and counter-trade, access to new markets or technology and shorter product development and life cycles (Bozarth et al., 1998) and better quality (Monczka et al 2005). On the other hand, those strategies more linked to faster delivery times and greater reliability would favour sourcing from closer to home (Manuj and Mentzer 2008) reinforcing this, buying from a foreign supplier through an extended delivery chain increases the risk of delay (Smith, 1999). In addition to these more or less classic priorities others have also been cited primarily related to innovation and sustainability (Monczka and Markham 2007), but the link to sourcing location has not been made.

Category characteristics and supply markets

The appropriate choice on sourcing location depends on various demand, supply and product-related characteristics that have a substantial impact on the actual cost of global sourcing decisions (Holweg et al. in press). Selecting those items for which buying internationally offers the maximum benefit, whilst choosing local sourcing for those which are likely to manifest the greatest obstacles, gives the opportunity to maximize the advantages of the global market at the lowest risk (Smith, 1999). From this call, we investigate the characteristics of categories and how these may influence the decision on where they are sourced from.

Category strategic importance

Very few papers so far (Jin, 2004; Mol et al. 2004: Smith, 1999) focus on which products are or should be chosen for domestic, regional or global sourcing. Some research suggests that global sourcing tends to concern low value and low risk items (e.g. Steinle and Schiele, 2008; Alquire et al, 1994), hence non strategic items from a portfolio perspective. However, the link between global sourcing and purchase categories identified through purchasing portfolio models remains relatively unexplored. Product type is more than an antecedent to global sourcing; it should be one of the key decision variables in choosing whether to source from domestic, regional or global sources or from some combination of them. The ultimate aim is not to have more global purchasing as such but depending on elements such as competition, customer demands and product value versus transportation costs, intermediate stages of globalization may be better options (Quintens et al. 2006).

Supplier power within the category

Power and dependence are persistent themes in purchasing research, however, power is not explicitly taken into account in Kraljic's (1983) model (Caniels and Gelderman 2005). Nevertheless, the supply market complexity or risk dimension of his model goes some way to consider power, as for example, high supply market complexity is usually a function of a small number of (powerful) suppliers: bottleneck and strategic suppliers are in a powerful position because there are few alternatives and thus high dependency. Kraljic's second matrix, which concerns only strategic item strategies, focuses more explicitly on power in recommending three strategies: exploit, balance and diversify. Supplier power may also relate to entry barriers for new suppliers to enter the supply market, level of concentration of the supply market, and the cost of switching suppliers (Caniels and Gelderman ibid). Therefore we may reasonably expect that where supplier power is higher, purchasers have to look further afield to find competitive sources and hence may wish to source globally.

Customisation within the category

In their case study in the automotive industry, Nellore et al. (2001) suggest that global sourcing can be disadvantageous for components that differentiate the final vehicle from competitors or contribute to brand identity, components that need specific supplier-based core competencies, components where innovation is a key success factor or components where technology is undergoing rapid evolution and change.

From these discussions we would expect there to be relationship between the strategic importance of the category, the level of supplier power and category customisation on the decision to source either locally or globally. However, the supply markets within each category are also likely to have an effect, so we discuss this possible influence next.

Supply market issues

The supply market itself is also likely to influence decisions on sourcing location. There are a number paths through which supply markets may affect these decisions ranging from

uncertainty and volatility of the market itself through to risks, uncertainty and change of the main technology involved.
Volume uncertainty refers to uncertainty in the demand for the final product and thus in the materials, components and services used in producing it. Mol et al. (2004) suggest that to compensate for increasing volume uncertainty, firms prefer close-to-home suppliers. For items with very volatile demand patterns, strong arguments exist for buying from suppliers who are close at hand and are able to respond to the fluctuating circumstances (Smith, 1999). Products with a stable and predictable demand can take advantages of cost benefits potentially achieved through global sourcing (Jin, 2004).
Linking to Kraljic's, (1983) view of pace of technological advance, it is clear that sourcing decisions will be influenced by the amount of change and uncertainty of technologies within a category. Smith (1999) suggest that the higher the rate of change of the technology, the greater the case for working through local sellers (Smith, 1999). When specifications are volatile and subject to change, the use of local or national distributors can offer ways to reduce the exposure from variation at relatively short notice (Smith, 1999). Greater the need to have regular contact between buyer and supplier at technical and commercial levels points towards the preference to procure from close-by suppliers (Smith, 1999). Products in their mature and declining phase are often manufactured in developing countries (Swamidass and Kotabe, 1993). Companies may also not want to manufacture a new product in a developed nation for fear of disclosing its technological secrets (Swamidass and Kotabe, 1993).

In summary, from the literature we can state that decisions on location of sourcing will be multi-dimensional taking into account many issues. Key elements of this relate to the chosen strategy objectives and how these can be achieved through sourcing decisions, i.e. low cost sourcing. Equally important however are also the specificities of the product being sourced (in our case category level specificities). The actual characteristics of the category especially the strategic importance is likely to be a key determinant. However, alongside this the supply market, its volatility, technological change rates and so on, are also likely to have an effect. Hence our approach is to explore these dimensions and find out which of them actually has an effect (or not) on the actual geographic location of category sourcing. Hence, the aim of this paper is to test whether variables associated with category strategy, category characteristics and supply market characteristics are related to specific location choices for sourcing ranging from a purely local to a global basis.

Method

There is a lack of data on global sourcing overall; specifically most empirical measurement has taken place in the late 1980s and early 1990s, and most of the firm level data are from one country, typically the United States (Nassimbeni, 2006; Mol et al. 2005). Sourcing research in the EU has mostly been confined to descriptions of particular sourcing relations and networks and there is no systematic evidence on the performance of international sourcing strategies of firms in European countries; few studies offer a sophisticated account of the location dimension of sourcing (Mol et al. 2005).

The data used in this paper is collected with the International Purchasing Survey (IPS) instrument. This is a survey designed to study purchasing and supply management practices and their effects on purchasing and business performance. The survey has been developed by a community of universities in eleven European and North American countries and data has been collected in Finland, Sweden, Spain, England, France, Germany, Italy, United States, Canada and Netherlands. The data collection took place in 2009 and a total of 681 usable responses were received to the survey. The IPS tool included multiple questions on firm

level, purchasing unit level and purchasing category level; the respondents selected a purchasing category of which they have intimate knowledge. This study focuses on the category level items in the survey, specifically concentrating on responses where it was indicated that the category in question was part of direct spend. Additionally, only the European data is used for analysis. This means the total number of responses used for analysis in this study is 548.

The countries involved in the IPS used slightly different approaches in data collection, specifically in terms of determining the population for study, and the method used in contacting respondents. To ensure that these different approaches, or the multinational nature of the data itself, do not interfere with the findings derived from the data analysis, steps have been taken pre and post data collection to ensure data equivalence in all its forms (construct equivalence, measurement equivalence, and data collection equivalence, see e.g. Hult et al. 2008). The analysis is based on grouping European companies (at the category level) according to the scope of their sourcing for a specific category. In this study we compare 7 groups. Group 1 consists of company categories that are only sourced locally (n=126). Group 2 consists of those which source from home and the region including western and eastern Europe (n=134). Group 3 includes those categories that are sourced from Europe only, not in the home country (n=57). Group 4 includes categories that are sourced from home and on a global basis but not within Europe (n=33). Group 5 includes categories that are sourced only globally, i.e. not from home or from Europe (n=22). Group 6 includes categories that are sourced from both Europe and outside, not from home (n=41). Group 7 includes categories that are sourced from home, Europe and outside (n=137). The four groups are compared, by means of ANOVA, in terms of the following multi-item constructs (Caniato et al., 2010): category strategy, category characteristics, and supply market characteristics. Such constructs are measured through the factors obtained by mean of an exploratory principal components factor analysis with varimax rotation, as shown in the following tables (variables are measured through Likert-like scales from 1 – extremely low to 6 – extremely high).

Category Strategy

	Delivery	Sustainability	Cost	Innovation	Efficiency	Quality
Improving supplier accuracy in delivery dates	.885					
Improving supplier lead-time	.847					
Reducing ecological impact for this category		.904				
Improving compliance with social and ethical guide		.881				
Reducing product/service unit prices			.896			
Reducing total cost of ownership of purchased inputs			.812			
Improving introduction rates of new/improved products				.845		
Improving time-to-market with suppliers				.752		
Reducing asset utilization for this category					.867	
Reducing (internal) purchasing process cost					.792	
Improving specifications and functionality of purchases						.828
Improving conformance quality of purchased inputs	.					.767
Cronbach's Alpha	0.844	0.857	0.714	0.803	0.693	0.753
Mean	3.96	2.91	4.25	3.28	3.25	3.69
Lowest Eigenvalue: 0.664 Total Variance Explained: 83%						

Category Characteristics

	Strategic Impact	Supplier Power	Customization		Supplier Threat
Category's impact on the cost of your products/services	.775				
Category's impact on the quality of your internal processes	.717				
Category's impact on perceived quality of your products/services	.683				
Entry barriers for new suppliers to enter the supply market		.741			
Level of concentration of the supply market		.732			
The cost for your organization to switch suppliers		.646			
The extent to which this category is customized			.892		
The extent to which suppliers of this category know each other				.851	
The extent to which suppliers of this category provide unique resources				.623	
The threat of a supplier of this category buying your firm					.969
Cronbach's Alpha	0.605	0.601	n.a.	0.440	n.a.
Mean	4.66	3.79		n.a.	
Lowest Eigenvalue 0.877 Total Variance Explained 70%					
The Factor with low Alpha is split into the original variables					

Supply Market Characteristics

	Technology uncertainty	Market Volatility	3	4	Company experience
The extent to which products/services are new to your firm	.884				
The extent to which technologies in this category are new to your firm	.876				
The extent to which technologies change in this category	.822				
The volatility of volumes		.807			
The volatility of prices		.765			
The average time-span of supplier relationships			-.835		
The rate with which you change suppliers for this category			.817		
The extent to which products/services can be specified unambiguously				.913	
The accuracy of demand forecasting for this category				.551	
The level of experience of your purchasing function with this category					.953
Cronbach's Alpha	0.827	0.526	n.a	0.337	n.a.
Mean	2.79	3.72		n.a.	
Lowest Eigenvalue 0.812 Total Variance Explained 72%					
The Factor with low Alpha is split into the original variables					

Results

The ANOVA on category strategy provided the results shown in the following table.

Group	N	**Cost**	Efficiency	Quality	**Delivery**	Innovation	Sustainability
1 Home only	124	**3.99***	3.33	3.58	**3.70**	3.08	2.90
2 Home & Europe	134	**4.15**	3.10	3.63	**3.96**	3.25	2.84
3 Europe only	57	**4.49**	3.16	3.58	**3.94**	3.22	2.81
4 Home & global	33	**4.29**	3.18	3.56	**3.88**	3.33	2.67
5 Global only	22	**4.23**	3.30	4.00	**4.02**	3.52	2.95
6 Europe & global	41	**4.44**	3.38	3.68	**4.29**	3.40	3.11
7 Home & Europe & global	137	**4.44***	3.33	3.85	**4.13**	3.42	3.04
Total	548	**4.25**	3.25	3.69	**3.96**	3.28	2.91
Sig.		**.002**	.534	.249	**.025**	.314	.585

*ANOVA on category strategy. *pairwise difference is significant at p<.05 (Scheffè test)*

The strongest difference concerns the Cost strategic objective, which is more important for categories sourced globally, compared to those sourced locally. This is not a surprising evidence, since it is in line with the recommendations found in the literature (Bozarth et al. 1998; Contractor et al. 2010), since the most common reason for sourcing globally is to reduce costs. However it is worth noticing that cost reduction, in comparison with the other goals, is the most important one also for the "Home only" group, which shows how cost is still "the" priority for purchasing managers, in particular if we consider that data have been collected during the global crisis. The other significant value refers to the delivery goal, for which we also find higher values for global categories compared to local ones, despite no significant pairwise difference is found. This is quite interesting, since a common issue with global sourcing is indeed delivery speed and reliability (Manuj and Mentzer 2008), given the distance and the complexity due to transportation, customs, etc. Therefore it is quite clear that improving delivery for categories sourced globally is a higher priority for purchasing managers compared to local categories. A similar line of reasoning can be applied to quality, for which there are no significant differences, although the highest average is found in the "Global only" group (low significance is probably related to the small group size), suggesting that quality is an issue for these categories.

While "traditional" priorities (cost, delivery and quality) show indeed some difference between local and global sourcing categories, values for the three more "innovative" priorities (efficiency, innovation and sustainability) are almost identical and definitely lower. The lack of difference among the groups seems related to the less focus on these priorities in general, no matter where the sourcing takes place.

The results of the ANOVA on category and supply market characteristics are shown in the following table:

	N	**Strategic impact**	**Supplier power**	Technology uncertainty	**Market volatility**	Suppliers know each other	Access unique resources	Customization	Forecasting accuracy	Time-span	**Supplier change rate**
1 Home only	126	**4.44**	**3.55**	2.78	**3.55**	3.99	3.25	3.77	3.82	4.48	**2.55**
2 Home & Europe	134	**4.71**	**3.94**	2.69	**3.85**	4.06	3.53	3.91	3.67	4.51	**2.67**
3 Europe only	57	**4.61**	**4.01**	2.73	**3.74**	3.86	3.30	3.89	3.70	4.52	**2.77**
4 Home & global	33	**4.37**	**3.56**	2.89	**3.62**	3.97	3.21	3.58	3.73	4.36	**2.97**
5 Global only	22	**4.68**	**3.77**	2.86	**3.43**	3.91	3.05	4.38	3.48	4.71	**2.32**
6 Europe & global	41	**4.90**	**3.97**	2.80	**3.67**	3.95	3.56	3.76	3.95	4.66	**2.78**
7 Home & Europe & global	136	**4.81**	**3.77**	2.88	**3.82**	4.01	3.56	4.00	3.66	4.57	**2.81**
Total	549	**4.66**	**3.79**	2.79	**3.72**	3.99	3.42	3.88	3.72	4.53	**2.70**
Sig.		**.002**	**.004**	.735	**.029**	.953	.103	.387	.531	.633	**.037**

ANOVA on category and supply market characteristics

We find four characteristics with significant values, although no significant pairwise difference is observed: strategic impact, supplier power, market volatility and supplier change rate.

The first significant characteristic is the Strategic impact of the category, whose highest values appear in the global groups (6 and 7), while the lowest ones refer to the "Home only" and "Home & global" group. It should be noted that such differences are very small (hence probably the absence of pairwise differences), however this result seems to contradict several previous contributions that suggest that strategic categories are preferable sourced locally (Arnold 1999, Steinle and Schiele, 2008). On the contrary, our results show that strategic categories are indeed sourced also internationally, generally with a mix of regional (i.e. Europe) and global sourcing, probably to keep closer alternative sources as backup.

Supplier power is also not very clear, since there is no strong difference between local and global categories. The highest values are anyway associated to the European and global categories, suggesting that such international sourcing categories are offered by strong suppliers, which is also in line with their strategic impact. Therefore global sourcing is not associated with "easy" markets, as it may be implied by the broader offering available.

Supply market volatility also presents contradicting results, since the highest values are in groups 3 and 7, while the lowest in groups 1 and 5, which are the opposite (Home only and global only). Therefore no clear pattern of relationship between market volatility and local vs. global sourcing can be identified, suggesting that market volatility is not a strong driver in the choice.

Finally, supplier change rate is significant, despite the very low value on average. The relatively higher values can be found for global categories, while the lowest refers to local ones. This may be explained with strongest relationships with local suppliers, while global ones are more unstable.

Customization, despite not being statistically significant, shows a higher value in the "Global only" group (again, the small group size explains the lack of significance). This is quite interesting since often customization is associated with local sourcing (Nellore et al. 2001), which is definitely not our case.

It is also interesting to notice that no significant difference can be found for all the other characteristics, despite some of them are generally considered as relevant in the local vs. global decision.

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